

REMARKS

By this amendment, claim 2 is canceled and also incorporated into claim 1 such that only claims 1 and 3-9 are before the Examiner for consideration on their merits.

In rejecting claim 2 under 35 U.S.C. § 103(a) based on United States Published Patent Application No. 2004/0074336 to Daimon et al. (Daimon), the Examiner has taken the following position.

- 1) The composition of Daimon encompasses the composition as claimed.
- 2) Daimon teaches a processing that is similar to that used to produce the claimed particles.
- 3) Daimon does not teach the characteristics of the particles of claim 1, as amended.
- 4) Since the composition and processing of Daimon are similar, the characteristics of claim 1, as amended, would be found in the particles of Daimon.

Applicant traverses the rejection on the grounds that the particles of Daimon are not the same or even similar to that claimed. More particularly, it will be shown below that the each particle of Daimon does not have fluidity in the state of being dispersed at a distance from each other as is recited in claim 1, as amended. The fluidity of the particles is best seen when viewing Figure 11 of the drawings. The traversal of the rejection is set out below

under the headings of the INVENTION, PRIOR ART REJECTION, DEPENDENT CLAIMS, 35 U.S.C. § 103(c) ISSUE, and DOUBLE PATENTING REJECTION.

INVENTION

Prior to demonstrating that Daimon does not disclose the claimed assemblage of particles, Applicant wishes to discuss in more detail the problem with the prior art and the reason for the invention.

The specification addresses the problem in the prior art polyol process beginning on the last line of page 6 and continuing to line 10 of the following page as follows:

With this method, the crystal nuclei are assumed to be generated continuously over time, so depending on the times when the individual crystals are formed, the ion composition ratio of the metal ions within the reaction solution will be different, and thus it is unavoidable that dispersion will occur in the diameters of the individual particles thus formed and in the sizes of the crystals within the particles, and as a result, it is inevitable that the compositions of the individual particles will differ from each other. Accordingly, even if they may have the fct structure, the individual particles may have a Pt content somewhat greater or less than the alloy composition (average composition) of the entire powder (a distribution appears in the composition of the individual particles and that distribution becomes broad), so some particles may be magnetic and some may not, and even if they are magnetic, their magnetism may be strong or weak.

The problem of non-uniformity of properties noted above existed not only in Patent Documents 1 and 2 as discussed in the specification but also Daimon. These problems are solved by the present invention using a process for making the particles that employs an adequate pressurized reduction, heat-up rate, and nucleating agents as shown in the Examples

corresponding to the invention and the Comparative Examples, both set out in the specification. The invention produces an assemblage of particles of a magnetic alloy as defined in claim 1, as amended. These particles have compositional uniformity by satisfying the conditions of (1) and (2) of claim 1 in spite of the fact that they have an fct fraction of 10-100 vol.% as synthesized and have fluidity in the state of being dispersed at a distance from each other.

The features of the particles of claim 1 are not only surprising but useful in that the particles prior to heat treatment, which have the fct phase and fluidity also have compositional uniformity. The magnetic particles having the fct phase can be oriented uniformly on a support material when they are in a magnetic field, while rotating freely in the magnetic flux direction of the outer magnetic field. This is impossible for the magnetic particles obtained by the phase transition heat treatment to product fct particles from fcc particles because the particles' positions are solidified to the substrate during the heat treating step and no longer capable of the free rotation of the inventive particles. Daimon practices this latter technique and it is this reason why Daimon cannot be said to teach the claimed assemblage of particles.

PRIOR ART REJECTION

Turning now to Daimon, this publication discloses FePt particles having an fct structure, i.e., a chemically ordered face-centered cubic tetragonal, obtained by heat treatment of FePt particles having an fcc structure, i.e., a chemically disordered face-centered cubic structure as well as a method to produce the FePt particles having an fcc structure using a polyol process. However, Daimon is silent with respect to producing the magnetic particles having an fct structure as synthesized and silent with respect to how to obtain such particles with compositional uniformity as synthesized.

In rejecting the claims, the Examiner alleges that Daimon teaches that the particles are dispersed from each other, citing paragraph [0062] of Daimon for support. However, Daimon does not teach that the magnetic alloy particles having the fct fraction of 10-100 vol.% are dispersed. The particles described in paragraph [0062], which are dispersed by using an organic protective agent, are those of metal alloy fine particles as produced, which should be subjected to heat treatment in order to produce magnetic alloy particles of fct structure. Put another way, the dispersed particles of paragraph [0062] do not have fct structure since they have not yet been heat treated.

The heat treatment of Daimon is performed at a temperature of 550-600 °C, with the conditions specifically explained in paragraphs [0079-0086]. In the disclosure of the heat treatment, it should be noted that there

is no description concerning the dispersion of the magnetic alloy particles obtained after having been subjected to the heat treatment.

More particularly and with reference to paragraph [0085], Daimon teaches:

The binary metal alloy fine particles synthesized by the method of the present invention are magnetically insulated even after the heat treatment. The insulating material seems to be a product resulting from carbonization of the organic protective agent by the heat treatment. These carbonized substances prevent sintering in the fine particles and maintain a particle size of 1 to 50 nm.

This description does not mean that the particles after the heat treatment could have the claimed fluidity. Even if the sintering during the heat treatment was prevented by the carbonized substances, and the particles maintained a particle size of the ones before the heat treatment, each particle would have been adhered to each other through the carbonized substances and could not freely rotate in the positions as the particles of the invention can. If nanoparticles of a size of 1 to 50 nm are subjected to heat treatment at 550-600 °C and the carbonized substances remain between the particles, the particles cannot freely flow. When an organic compound such as the organic protective agent of Daimon exists on the surface of the particles, the compound would be a residue adhered to the particle surfaces after heat treatment.

When the particles of Daimon are used in a magnetic disk, the heat treatment is such that "the obtained metallic alloy fine particles (adhering

organic protective agents) are dissolved in alcohols or ketones, and applied onto a non-magnetic heat-resistance substrate to a thickness of 2 or 100 nm by dip coating”, see lines 1-8 of paragraph [0086] of Daimon. A paint which contains the alloy particles dispersed is coated on the substrate, then heated on the substrate thereby to form a magnetic layer comprising fct particles on the substrate. The particles in the magnetic layer must have their positions rigid and should not freely flow from the substrate.

Contrary to Daimon, the particles of the invention and as defined in claim 1, as amended, have an fct phase even if such heat treatment is omitted and have fluidity as stipulated in the claim, i.e., the particles of size D_{TEM} are dispersed from each other at a distance so that each particle has fluidity in the state of being dispersed at a distance from each other, see Figure 11 again to better understand this fluid state. The combination of the fct phase and the claimed fluidity is not found in Daimon and Daimon cannot be said to establish a *prima facie* case of obviousness against claim 1 in its amended state.

The particles of the invention that are different from those of Daimon have an advantage over Daimon in that the particles can rotate freely in the magnetic flux direction of the outer magnetic field when they are in the magnetic field in production of a coating type magnetic disk or tape.

Daimon is also distinguishable from the invention when considering limitation E of claim 1. In the rejection, the Examiner notes that the alloy

powder composition of Daimon encompasses the alloy powder composition of claim 1. However, a similarity in composition is not the issue to be resolved when considering limitation E of claim 1. Limitation E relates to not only an average composition but also a composition of each particle. Moreover, satisfying limitation E is a breakthrough in the field of nanoparticles. This breakthrough is explained in the context of the problem on non-uniformity in the composition of the individual particles, see the last line of page 5 to line 16 of page 6 of the specification. Overcoming this problem by having compositional uniformity as defined by limitation E is a significant advancement over the prior art and a feature that is not found in Daimon. Moreover, such compositional uniformity is not an obvious feature of Daimon since there is neither recognition of the problem nor any suggestion of solving the problem by attaining the inventive solution.

As noted above, the inventors have discovered the means by which to achieve such compositional uniformity, i.e., adequate pressurized reduction, heat-up rate, and nucleating agents, particularly the nucleating agents shown in the Examples. This showing is substantiated by the fact that the features of the invention are not attainable in the Comparative Examples. There is absolutely no hint in Daimon for using such nucleating agents in order to lower the dispersion of the compositions between particles. The method using the nucleating agents disclosed in the present specification and the product of such process, i.e., that defined in claim 1, as amended, is

not disclosed in Daimon. Lacking a similarity in processing, the Examiner cannot assume that the features of claim 1 that are not expressly disclosed in Daimon to be inherently present and the rejection fails for this reason. Thus, a *prima facie* case of obviousness has not been established by Daimon and the rejection as applied to claim 1 must be withdrawn.

35 U.S.C. § 103(c) ISSUE

In response to the Examiner's notation that the claims are not patentably distinct from co-pending application no. 10/812,078 (the co-pending application), Applicant submits that the co-pending application and this application were commonly owned at the time of the invention of this application. This statement is sufficient evidence to remove the co-pending application as prior art as noted in MPEP 706.02(I)(2). This common ownership precludes applying the co-pending application against the instant claims. Thus, the rejection in this regard must be withdrawn.

DEPENDENT CLAIMS

Claims 3-9 are also in condition for allowance by reason of their dependency on claim 1.

TERMINAL DISCLAIMERS

In the Office Action, the Examiner cited 10/812,078 in the double patenting rejection. However, this application has been abandoned in favor of continuation application no. 12/285,857. Therefore, a Terminal Disclaimer is filed based on the co-pending application, not the abandoned parent. A Terminal Disclaimer is also filed relating to United States Patent No. 7,390,576. By the Terminal Disclaimer filings, the obviousness-type double patenting rejections are overcome.

Accordingly, the Examiner is requested to examine this application in light of this response and pass all pending claims onto issuance.

If the Examiner believes that an interview would be helpful in expediting the allowance of this application, the Examiner is requested to telephone the undersigned at 202-835-1753.

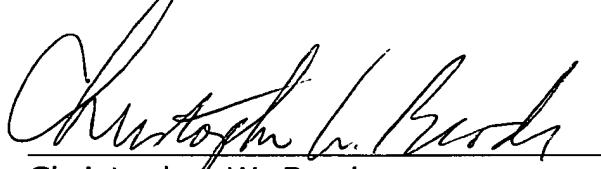
Again, reconsideration and allowance of this application is respectfully requested.

The above constitutes a complete response to all issues raised in the Office Action dated September 25, 2008.

A petition for a one month extension of time is made and a check in the amount of \$130.00 is submitted.

Please charge any fee deficiency or credit any overpayment to Deposit
Account No. 50-1088.

Respectfully submitted,
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